REMARKS

Applicants very much appreciate Examiner Don Williams and Patrick Lee for conducting the telephonic interview on June 26, 2007. During the interview, Applicants discussed with the Examiners, the Office Action, the invention claimed in this application, and the distinctions between the claimed invention and the references cited in the Office Action, *i.e.*, U.S. Patent No. 6,210,973 ("Pettit") and 5,567,294 ("Dovichi *et al.*").

As a result of the interview, instant Claims 1, 5, 7 and 9-10 have been amended to recite the inventions with greater clarity. Claim 4 has been canceled.

Claim 1 has been amended to replace "a sample containing sample particles" with "a fluid containing sample particles." The term "capillary" is replaced with "a capillary providing a predetermined volume."

Claim 5 has been amended to replace "causing the particles to flow through an analyzing region" with "causing a fluid containing particles to be analyzed to flow through an analyzing region in a capillary."

Claim 7 has been amended to replace "a capillary for receiving the sample fluid" with "a capillary for receiving a sample fluid containing particles to be analyzed and providing a predetermined region."

Claim 9 has been amended to replace "causing the fluid to flow past a source of illumination whereby particles emit fluorescent light at the one or more wavelengths" with "causing a fluid containing particles which fluoresce at one or more wavelengths to flow in a capillary past a source of illumination whereby the particles emit fluorescent light at the one or more wavelengths." Claims 9-10 have been amended to replace "periodically" with "repetitively." Support for this amendment can be found for example in the Specification from page 4, line 22 to page 5, line 6.

The amendments to Claims 1, 5, 7, and 9-10 are supported by the original disclosure and no new matter has been introduced by such amendments.

Upon entry of the Amendments, Claims 1-3 and 5-10 remain pending and under consideration.

Objections to the Drawings:

The drawings have been objected to under 37 CFR 1.121(d) as the references numbers have been manually written with respect to FIGS. 4 and 6-7.

Applicants are in the process of preparing formal drawings and will submit the formal drawings as soon as they are available.

Claim Rejections under 35 U.S.C. § 102(b):

Claims 9-10 stand rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by U.S. Patent No. 6,210,973 ("Pettit"). Applicants respectfully request reconsideration.

Instant Claim 9, as amended, now calls for a method of analyzing particles in a fluid comprising the step of, among other limitations, causing a fluid containing particles which fluoresce at one or more wavelengths to flow in a capillary past a source of illumination, and repetitively detecting the emitted characteristic fluorescence of each of said particles as the particles flow through the illumination source.

Pettit is directed to an apparatus for sequencing DNA in which a laser beam is sequentially focused on DNA fragments as they migrate along a plurality of lanes through a polyacrylamide gel under the influence of an applied electrical field. See Abstract. Migration of DNA fragments in a polyacrimide gel under the influence of an electric field is a well-known technique that is commonly referred to as gel electrophoresis. In this technique, samples are placed in one or more wells in a solid gel. See Col. 7, lines 3-7. An electrical potential is applied to electrodes on opposite

sides of the gel and the resulting electric field causes DNA fragments to migrate from the sample wells through the gel at a rate that is principally determined by their size.

Pettit does not teach or suggest causing a fluid containing particles which fluoresce at one or more wavelengths to flow in capillary past a source of illumination, as called for by instant Claim 1. During the telephone interview, Applicants respectfully pointed out that, in Pettit, the DNA strands to be analyzed move through a gel under the influence of an electric field. However, the gel is stationary. Because the gel is stationary, the fact that DNA fragments migrate down the gel does not constitute causing a fluid containing particles to flow in capillary past a source of illumination. There is no fluid flow in Pettit since the electrophoresis gel is stationary. Migration in a stationary gel is different from flow of a particle-containing fluid in a capillary.

Furthermore, as Applicants respectfully pointed out during the telephone interview, Pettit teaches pause or delay between data records is inputted. See Col. 14, lines 37-50. According to Pettit, a delay is needed because the optical techniques used in Pettit are much faster than the migration of the DNA fragments in the gel. Therefore, a delay of about 0.01 to approximately 3 seconds will be necessary between taking data records in order to not generate an amount of data that cannot be handled or that is redundant. The time sequence of the fluorescence is not required by or taught by Pettit. It is not possible with the teaching of Pettit to obtain the time sequence of particles as they pass the laser beam.

Pettit does not teach or suggest repetitively detecting the emitted characteristic fluorescence of each particle as the particle flows through the illumination source, as now called for by instant Claim 9. Instant Claim 9 teaches repetitive scanning. One purpose of multiple wavelength scanning is to accurately reproduce the temporal shape of the pulses that are produced at different wavelengths. A single scan wavelength as taught in Pettit does not provide accurate information on the maximum pulse height or the actual shape of the pulse.

Based on the foregoing, Applicants respectfully request reconsideration of the rejection of Claim 9 under 35 U.S.C. 102(b) over Pettit. Claim 10 depends on Claim 9 and is therefore allowable for at least the same reasons as for Claim 9.

Claim Rejections under 35 U.S.C. § 103:

Claims 1-8 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over U.S. Patent No. 5,567,294 ("Dovichi *et al.*") in view of Pettit. Applicants respectfully request reconsideration.

Dovichi *et al.* do not teach or suggest projecting a light beam through a capillary to illuminate a predetermined volume or region in said capillary as called for by instant Claim 1, 5 or 7. Dovichi *et al.* teach that at the ends 24 of the capillary tubes 26, the sheath fluid entrains sample fluid from the capillaries, in the form of individual filaments 126 of fluid, as best shown in FIG. 11. See also Col. 5, lines 20-23. A laser 130 provides a collimated beam 132 of light that is aligned to pass from a focusing lens 134 into the chamber 34, as close as possible above the barrier member 90. This interrogation region is clearly outside the capillaries, and the light beam does not substantially pass through the capillaries. See Col. 5, lines 29-32. The collimated beam 132 illuminates the sheath fluid and filament 126 as shown in FIG. 11. Dovichi *et al.* do not teach projecting a light beam through a capillary to illuminate a predefined volume or region in the capillary.

Indeed, Dovichi *et al.* teach a sheath flow particle analyzer, but do not teach or suggest a capillary particle analyzer as called for by instant Claims 1, 5 or 7. One of ordinary skill in the art understands that a sheath flow cytometer is completely different from a capillary flow cytometer. In a sheath flow cytometer, a sample fluid is confined by a sheath fluid to a region near the flow axis in the region of the flow where it is illuminated. In contrast, in a capillary flow cytometer, a sample fluid containing particles to be analyzed is confined by a capillary tube as it is illuminated. There is no sheath fluid in a capillary flow cytometer.

More importantly, Dovichi *et al.* do not teach or suggest projecting a light beam through a capillary to illuminate a predetermined volume region in the capillary so that a fluid containing sample particles passes through the predetermined volume or region for detection, as called for by instant Claim 1, 5 or 7.

In the multicapillary analyzer of Dovichi *et al.*, it would be disadvantageous to illuminate a sample fluid while it is still in the capillaries because the capillaries closest to the laser 130 would cast shadows on those further away. This shadowing effect would change the relative temporal and amplitude characteristics of the light pulses produced by identical particles passing through different capillaries that are located at different distances from the laser 130.

During the telephone interview, the Examiners raised the question of the photodetector orientation in Dovichi, referring to col. 5 lines 56 – 63. The preferred orientation of this detector is in the direction of the capillary array (col. 5 lines 64 – 67). However, Dovichi points out that this orientation is "to obtain a high quality picture of the fluorescence". This orientation applies to the photodetector and does not imply that the light beam passes through the capillaries. Dovichi further clarifies this interpretation in column 5 lines 64 – 67 and column 6 lines 1 – 9.

The Office Action states that Dovichi discloses a spectral filter 139 for receiving light emitted by each particle, a detector (CCD chip, 138) for detecting the output light and a processor computer, 142 configured to receive the output pulse signals representative of the amplitude of the fluorescent wavelengths. Dovichi et. al. fail to disclose a multicolor particle analyzer and a tunable filter. However, the Office Action further states that Pettit discloses an acousto-optic tunable filter, and the use of acousto-optic tunable filters is known in the art. Accordingly, the Examiner concludes that it would have been obvious for one of ordinary skill in the art to modify Dovichi *et al.* to include the acousto-optic tunable filter as taught by Pettit in order to allow the passing of desired tagged pulses of fluoresce wavelengths which are detected and converted into electrical signals wherein the pulse output result in clear and precise images

displayed on a monitor allowing critical and effective analysis to be performed. Applicants respectfully disagree.

Dovichi *et al.* teach an apparatus with a plurality of capillary tubes (26). According to column 3, lines 39-41, "the tubes are arranged in a generally rectangular array, which in the example shown is an array of five tubes by five tubes." DNA fragments or analyte molecules are entrained by a sheath fluid as they leave the ends 24 of the capillaries 26 and are illuminated by the collimated light beam 132 in the space 42 between the capillary ends 24 and the barrier member 90. Light emitted by the sample particles as they flow through the light beam passes through holes in the barrier member 90 and is imaged by the condenser lens 136 onto a photodetector 138, which is preferably a large area CCD chip or large area CCD camera. The active area of the CCD chip or camera is "as large as or larger than the area of the capillary array, thus providing high collection efficiency" (Dovichi, column 5, lines 57-60).

If one of ordinary skill would attempt to combine Dovichi *et al.* with Pettit, the combination will not arrive at the invention recited in Claim 1, 5 or 7 because neither Dovichi *et al.* nor Pettit teach or suggest a capillary flow cytometer, and because neither Dovichi *et al.* nor Pettit teach or suggest a tunable filter for receiving light emitted by each particle and repetitively passing light pulses for each wavelength of light emitted by each particle as it passes through a predetermined volume in a capillary.

Based on the foregoing reasons, Applicants respectfully request reconsideration of the rejections of Claims 1, 5, and 7 under 35 U.S.C. 103(a) over Dovichi *et al.* in view of Pettit. Claims 2, 3, 6, and 8 depend on Claims 1, 5, and 7 respectively and they are therefore allowable for at least the same reasons as for Claims 1, 5 and 7.

Applicants respectfully submit that the instant application is in condition for allowance. An early indication of the same is therefore respectfully requested. If any matters can be resolved by telephone, the Examiner is invited to call the undersigned attorney at the telephone number listed below.

No fees beyond those being submitted concurrently herewith are believed due. The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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By _____

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